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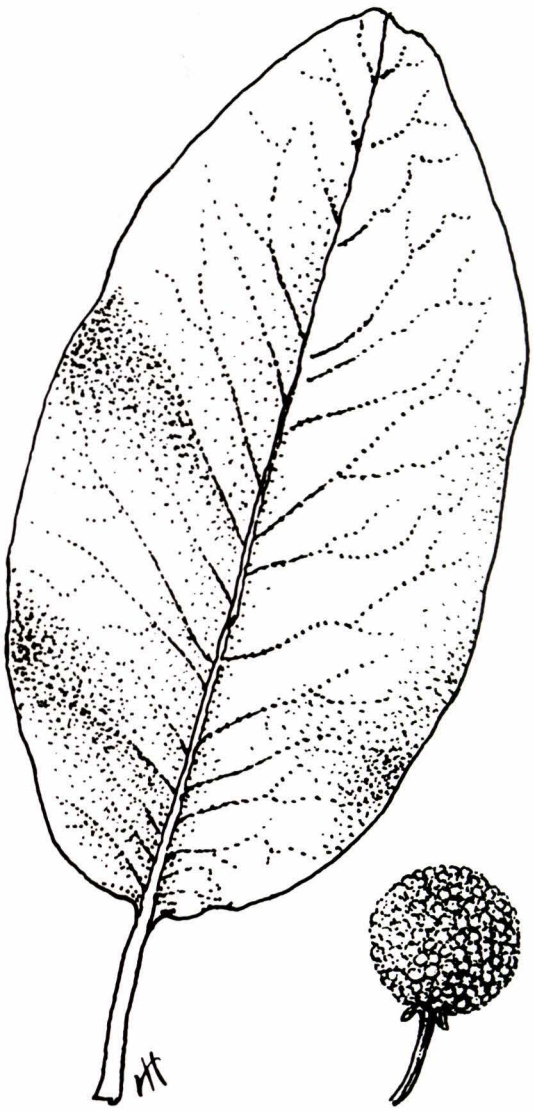
ARBUTUS

(madrones)

This genus of broadleaf evergreen trees has about 12 species, of which 3 are in western United States and the others in Mexico, Central America, and the Mediterranean region. Pacific madrone, of the West Coast, is the only important native species. Two others are found near the southwestern border from Arizona to Texas.

Madrones have distinctive bark, red on the smooth branches, peeling in large thin scales, and on large trunks becoming dark reddish brown with scaly plates that shed. The small winter buds have many overlapping scales. Leaves are usually oblong, thick and leathery, mostly entire though sometimes saw-toothed on young plants, and shiny dark green, paler beneath. The second year they turn orange or red and fall.

Many small white flowers, urn-shaped and 5-toothed, are borne in terminal branched clusters in spring. The small round orange-red fruits, usually granular on the surface, contain mealy flesh and a 5-celled, many-seeded stone. They ripen in autumn and are persistent in winter.



F–462284

PACIFIC MADRONE (*Arbutus menziesii* Pursh)

Other common names: Madrone, madrona, or madroño.

Pacific madrone is a widely occurring tree native to the Pacific coast. The northern limits of its range are at about latitude 50° N., in the vicinity of Seymour Narrows on the eastern coast and locally on the western coast of Vancouver Island, British Columbia. From this point south, Pacific madrone occurs fairly commonly west of the Cascade Range in Washington and Oregon. It grows on the west slope of the Sierra south to central California and extends farther south in the coastal mountain ranges of southern California.

HABITAT CONDITIONS

Climate

The climatic environment under which Pacific madrone grows is exceedingly variable; it ranges through superhumid, humid, and moist subhumid. Annual rainfall within its range may be as great as 166 inches or as little as 18 inches. Growing season precipitation (April-September) varies from 40 inches to less than 1 inch. Extremes in temperature are also wide, varying from a low of −6° F. to a high of 115°. The whole area is classed as humid transition (*3*).[1]

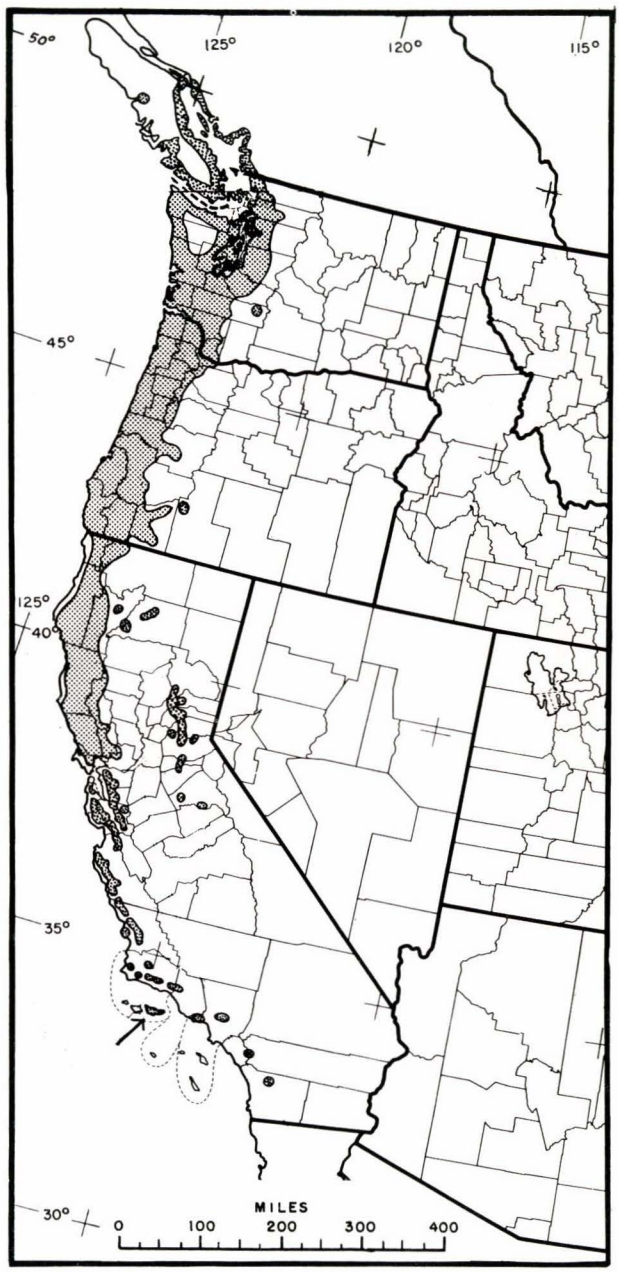
Soils and Topography

In the northern part of its range, Pacific madrone usually occurs on glacial till or thin rocky soils. It also grows on single-grained sandy soils adjacent to coastal dunes along the Washington and Oregon seacoast. Sometimes it may be found on fine-textured soils ranging from loam to clay loam in texture. In the south, it grows on granitic or quartz diorite materials, on sandstones and shales, and on soils derived from igneous rock. No definite soil association is evident from the presence of Pacific madrone, although a site in which soil moisture is low during most of the summer is often suggested.

Under a Pacific madrone cover, soil reaction values range from about pH 4.5 through 7.0. Soil series associated with this species include Everett, Spanaway, Hoodsport, Olympic, Astoria, Melbourne, Siskiyou, and Holland.

Pacific madrone is found on many different types of terrain, such as foothills and low mountain slopes of every aspect, borders of streams, and cool canyons and valleys. There appears to be no best topographic condition for this tree since it thrives under a wide range of temperature and moisture conditions.

Altitudinal limits range from sea level to 6,000 feet at latitude 43° N.



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The range of Pacific madrone.

[1] Italic numbers in parentheses refer to Literature Cited, p. 91.

Associated Trees and Shrubs

Pacific madrone grows as an understory species in many places. When it grows in a mixture with tree species associated with a subhumid climate, it may assume a position of codominance. The tree is a major species in only the Oak—Madrone Type (Type 234). It is a component of the following forest cover types.

Type No.	*Type*
229	Pacific Douglas-Fir
230	Douglas-Fir—Western Hemlock
231	Port-Orford-Cedar—Douglas-Fir
232	Redwood
233	Oregon White Oak
234	Oak—Madrone
243	Ponderosa Pine—Sugar Pine—Fir
244	Pacific Ponderosa Pine—Douglas-Fir
249	Canyon Live Oak
250	Digger Pine—Oak

Other trees found with Pacific madrone include tanoak, golden chinkapin, incense-cedar, white fir, grand fir, bigleaf maple, California-laurel, California black oak, and California live oak. Various species of *Arctostaphylos*, *Ceanothus*, and *Rubus* are common shrubs.

LIFE HISTORY

Reproduction and Early Growth

Some general phenological observations are:

	Southern range	*Northern range*
Leaf bud swelling begins	February	Late March.
Flower bud swelling begins	March	May.
Flowering begins	March	May.
Full bloom	April	June.
Second-year leaves fall	June	June–July.
Bark exfoliates	June–July	June–September.
Fruits mature	September–October.	October.

Little is known about Pacific madrone seed production. The seed is heavy—averaging about 2,000 per pound. Good seed crops appear to be produced regularly. Birds and animals are believed to be a major factor in seed dissemination.

The time and period of seed germination varies from February to April, according to the climate. Temperature requirements are not rigid.

Pacific madrone establishes itself from seed best on a moist but well-drained soil. Seedlings are not abundant, however, and sprouts form the major type of reproduction. It grows best in warm, fairly moist locations such as the fog belt of northern California.

The species sprouts freely from stumps and is commonly found in clumps as a result of this. Ease of propagation by cuttings is fair, but the practice is confined to commercial nurseries.

Sapling Stage to Maturity

Tree height at maturity on good sites is about 80 feet; on medium sites, 30–60 feet; and on poor sites, only 15–25 feet. The largest specimen reported had a circumference of 27 feet 8 inches at a height 4.5 feet from the ground (*1*). Volume per acre is low since Pacific madrone does not grow in pure stands.

Pacific madrone's tolerance is intermediate (*2*). It responds well to release, and grows well as an understory tree in lightly stocked timber stands. The species is resistant to high temperatures, and also to wet, freezing conditions (*4*). Once established, the species is very drought resistant.

Fire damage is common, but burned trees often regenerate from root sprouts. Insect damage is not major, although several species of caterpillars and wood borers commonly feed on Pacific madrone. Various leaf diseases on the species have been found. Root and crown rots, especially those caused by *Phytophthora* canker (*5*), also have been discovered.

RACES AND HYBRIDS

Nothing is known about variation in this species, nor are there any known hybrids.

Revised from "Silvical Characteristics of Pacific Madrone," by R. F. Tarrant. U.S. Forest Serv. Pacific Northwest Forest and Range Expt. Sta. Silvical Ser. 6, 10 pp. 1958.

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